REMARKS

Applicant respectfully request favorable reconsideration and reexamination of this application. Claim 5 has been revised and supported by, for example, page 6, line 31 to page 7, line 2 in the Specification. Claim 19 has been revised and supported by, for example, Fig. 2 in the Specification. Claim 18 has been cancelled. There is no new matter. Claims 1, 3-17, 19, and 21-22 are pending.

Priority Under 35 U.S.C. § 119

The Office Action Summary page did not acknowledge that a claim for foreign priority was made. On February 26, 2004, this continuation (divisional) application was filed claiming priority to its parent U.S. application (Serial No. 09/575348) and also claimed foreign priority to the following.

Country	Application No.	Filing Date
Japan	11-139568	05/20/99
Japan	11-139569	05/20/99
Japan	11-139570	05/20/99
Japan	11-173803	06/21/99
Japan	11-173804	06/21/99
Japan	11-173805	06/21/99
Japan	11-206351	07/21/99
Japan	11-206352	07/21/99

Certified copies of the foreign applications were filed for the parent application on August 23, 2000 and received by the USPTO on August 25, 2000 (see PAIR). Applicants respectfully request acknowledgement of claim for foreign priority under 35 U.S.C. 119 and that certified copies of the priority documents have been received in Application No. 09/575348 in the next Official communication.

Claim Rejections - 35 U.S.C. § 103

Claims 1 and 3 were rejected under 35 U.S.C. 103(a) as being unpatentable over JP 61-1292246 (hereafter JP'246) in view of Tomioka et al. (US 3532560). Applicants respectfully traverse this rejection.

The rejection conceded that JP'246 does not disclose the drawing ratio as claimed. The rejection states that Tomioka et al. satisfies this deficiency by teaching a drawing ratio of less than 20%. Even if Tomioka et al. teaches a drawing ratio that is less than 20%, which Applicants are not conceding, one of ordinary skill in the art would not combine the drawing ratio according to Tomioka et al. with the methods taught in JP'246.

JP'246 expressly teaches that step 2 in Figs. 1 and 2 is a "softening anneal" step (machine translation of abstract). JP'246 teaches that the wire drawing step 11 follows the "softening anneal" step 2 in Figs. 1 and 2. Accordingly, in JP'246, a drawing step is applied to a soft annealed material. In contrast, Tomioka et al. teaches that the drawing ratio of "about 13%" is applied to a steel wire with a sorbite structure. The drawing ratio according to Tomioka et al. is applied to a tempered and quenched material to obtain a tempered steel wire of uniform fine grain sorbite structure (column 7, lines 8-65). A quenched and tempered material having a sorbite structure has a high hardness. Accordingly, the drawing step in Tomioka et al. is performed on a substantially different material than the soft material taught in JP'246. Thus, the drawing step in Tomioka et al. is performed to achieve a different result than the drawing step in JP'246. Therefore, there is no motivation to combine the "less than 20%" drawing ratio taught in Tomioka et al. that is applied to obtain a uniform fine grain sorbite structure on a hardened material, with a drawing step taught in JP'246 that is applied to a softened annealed material.

Moreover, claim 1 requires a first spheroidizing annealing step of spheroidizing a carbide in a blank comprising ferrite and pearlite, wherein the pearlite is spheroidized. A softening annealing process according to JP'246 alone does not teach or suggest nor would it inherently result in a blank wherein the pearlite is spheroidized. Even if Tomioka et al. suggests that both annealing process and spheroidizing annealing process lead to reduction of hardness for cold shaping operations, which Applicants are not conceding, Tomioka et al. does not suggest spheroidizing a carbide in a blank comprising ferrite and pearlite, wherein the pearlite is spheroidized. Even more, Tomioka et al. teaches that a pearlite structure is undesirable because pearlite reduces the tensile strength of the steel wire (see column 7, lines 32-39). Further, neither of the references recognizes the benefits of the claimed structural feature. Thus, for at least the above reasons, claim 1 is patentable over JP'246 in view of Tomioka et al. Claim 3 is also

patentable for at least the same reason as claim 1 from which it depends. Applicants respectfully request a favorable reconsideration of the claims.

Claim 4 was rejected under 35 U.S.C. 103(a) as being unpatentable over JP'246 in view of Tomioka et al. and further in view of JP 07-097656 (hereafter JP'656). JP'656 does not remedy the deficiencies of Tomioka et al. and JP'246 stated above. Accordingly, claim 4 should be allowed for at least the same reasons as claim 1 from which it depends. Applicants respectfully request a favorable reconsideration.

Claims 5 and 9 were rejected under 35 USC 103(a) as being unpatentable over JP'246 in view of Tomioka et al. and further in view of Bach et al. (US 4704166). The rejection conceded that neither JP'246 nor Tomioka et al. teach quenching a blank to form a martensite structure on the surface of the blank. The rejection also stated that Bach et al. teaches a method for forming a surface layer of martensite and that it would have been obvious to one of ordinary skill in the art that forming the surface layer of martensite is desired. Applicants respectfully disagree.

Even if Bach et al. teaches forming a surface layer of martensite, which Applicants are not conceding, none of the references teach or suggest forming an intermediate layer comprising martensite, ferrite, and pearlite formed radially inwardly on the surface, and a central region comprising a mixed phase of ferrite and pearlite, and then annealing the blank to convert the martensitic structure of the surface and the intermediate layer into a fine spheroidized structure comprising ferrite and cementite, and breaking the pearlite of the intermediate layer and the central region. Further, none of the references teach or suggest obtaining the surface with the fine spheroidized structure comprising ferrite and cementite, the intermediate layer comprising a mixed structure of the broken pearlite and the fine spheroidized structure comprising ferrite and cementite, and the central region comprising broken pearlite.

Moreover, it would not have been obvious to one of ordinary skill in the art that forming the surface layer of martensite is desired because Bach et al. expressly teaches away from forming the surface layer of martensite. Bach et al. teaches that the surface layer of martensite is an undesirable structure that must be avoided. Bach et al. states that the formation of the surface layer of martensite "is a risk" (column 1, line 60). Further, Bach et al. teaches that the surface

formation of martensite is a "problem" which should be solved with "various technical solutions" (column 1, lines 60-63). Accordingly, Bach et al. expressly teaches away from forming the martensite structure on the surface. Accordingly, because Bach et al. teaches away from such a structure, one of ordinary skill in the art would not be motivated to combine the "risk of the surface formation of martensite" with JP'246 and Tomioka et al.

Accordingly, the cited references do not teach or suggest all of the claimed features of claim 5. Claim 5 is patentable over JP'246 in view of Tomioka et al. and further in view of Bach et al. Claim 9 is also patentable for at least the same reasons as claim 5 from which it depends. Applicants respectfully request a favorable reconsideration of the claims.

Claims 6-8 were rejected under 35 USC 103(a) as being unpatentable over JP'246 in view of Tomioka et al. and further in view of Bach et al. and further in view of JP'656. JP'656 does not remedy the deficiencies of Bach et al., Tomioka et al., and JP'246 stated above. Accordingly, claims 6-8 should be allowed for at least the same reasons as claim 5 from which they depend.

Further, regarding claims 6-7, Tomioka et al. teaches that the "heating temperature for tempering is an important factor and the heating or tempering temperature should be suitably selected within the specified temperature range of 300 ° to 700 °C" (column 7, lines 43-45).

Moreover, Tomioka et al. teaches away from a heating or tempering temperature above 700 °C as undesirable because "if the tempering heating temperature is in excess of 700 °C., the decomposition of the martensite structure of the steel wire into the sorbite structure is too rapid, resulting in a coarse grain sorbite structure or a pearlite structure which reduces the tensile strength of the steel wire ... therefore, a tempering heating temperature in excess of 700 °C is objectionable where it is desired to produce a tempered steel suitable for producing a cold-forged product" (column 7, lines 32-39).

In contrast, claim 6 requires annealing the blank by holding the blank at about 740 °C. Claim 7 requires annealing the blank by holding the blank at about 750 °C for 4 hours, then at about 735 °C for 3.5 hours. Accordingly, both claims 6 and 7 require temperatures that are specifically taught in Tomioka et al. as undesirable. Thus, even if JP'656 discloses annealing temperature of 730 °C, which Applicants are not conceding, there is no motivation to combine

the reference with the teachings of Tomioka et al. which specifically teaches that such temperature is undesirable. Further, because Tomioka et al. specifically teaches away from the claimed temperatures, the claimed features are not discovering an optimum values involving only routine skill in the art. Claims 6-8 are patentable over JP'246 in view of Tomioka et al. and further in view of Bach et al. and further in view of JP'656. Applicants respectfully request a favorable reconsideration.

Claim 18 has been cancelled. Applicants do not concede the correctness of the rejection.

Claim 19 was rejected under 35 USC 103(a) as being unpatentable over JP'246 in view of Tomioka et al. and further in view of JP'656 and Sakai et al. Applicants respectfully disagree that the references teach or suggest all of the features of claim 19. Claim 19 requires a drawing ratio of approximately 20%. This drawing ratio is not obvious in view of JP'246 and Tomioka et al. as discussed above in regard to claim 1, which also requires a drawing ratio of approximately 20%. Neither JP'656 nor Sakai et al. remedy the deficiencies of JP'246 and Tomioka et al. For at least this reason, claim 19 is patentable over JP'246 in view of Tomioka et al. and further in view of JP'656 and Sakai et al. Applicants respectfully request a favorable reconsideration of the claim.

In view of the above, early issuance of a notice of allowance is solicited. Any questions regarding this communication can be directed to the undersigned attorney, Curtis B. Hamre, Reg. No. 29,165 at (612) 455-3802.

Respectfully submitted,

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